

**CLAIM AMENDMENTS**

Claims 33-65 are pending, claims 1-32 have been canceled; and claims 33-35 are amended herein, and claims 36-65 are newly added.

Claims 1-32 (canceled)

1           33 (currently amended): An ordnance energy transfer system, comprising:  
2           a ~~Rapid Deflagration Cord (RDC)~~ rapid deflagrating cord extending from a first end and a  
3           second end of a transfer line, said rapid deflagrating cord having a burn a rate of 1000 to 1500 feet  
4           per second; and  
5           a first metal tubing hermetically encapsulating said ~~[[RDC]]~~ rapid deflagrating cord from said  
6           first end to said second end of said transfer line, said first metal tubing being crimped at each end  
7           thereof, onto said transfer line at said first and second ends of said transfer line, to hold said rapid  
8           deflagration cord in place in said first metal tubing[[:]]  
9           ~~a first loaded end fitting disposed at said first end of said transfer line;~~  
10          ~~—— a second loaded end fitting disposed at said second end of said transfer line;~~  
11          ~~—— a first ferrule connecting said first end of said transfer line to said first loaded end fitting; and~~  
12          ~~—— a closure cup having a rim welded to said first ferrule.~~

1           34. (currently amended): The system of claim 33, further comprising a first loaded end fitting  
2           disposed at said first end of said transfer line, said first loaded end fitting having a first ferrule being

3 welded to said first metal tubing at said first end of said transfer line to form a hermetic seal for said  
4 [[RDC]] rapid deflagrating cord and for charges stored in said first loaded end fitting during shelf  
5 life, installation and use preventing unwanted moisture from entering the system and preventing  
6 gases produced from said system from escaping.

1 35. (currently amended): The system of claim 34, said first ferrule being surrounded and  
2 attached to an annular sealing material that provides a hermetic seal for said first loaded ~~first~~ end  
3 fitting and said [[RDC]] rapid deflagrating cord when said first loaded end fitting is installed inside  
4 a transfer manifold.

1 36. (new) The system of claim 34, further comprising a second loaded end fitting disposed  
2 at said second end of said transfer line, said second loaded end fitting having a second ferrule  
3 connecting said second end of said transfer line to said second loaded end fitting.

1 37. (new) The system of claim 36, each respective ferrule being crimped to respective ends  
2 of said first metal tubing firmly pinching respective ends of said rapid deflagrating cord into  
3 respective loaded end fittings.

1 38. (new) The system of claim 34, said first ferrule having a booster charge stored therein,  
2 said first ferrule being laser beam welded to a rim of a first closure cup, said first closure cup facing  
3 away from said booster charge, said laser beam welding allowing stainless steel from said first

4 closure cup and said first ferrule to mix and to serve as a donor of steel to said laser beam weld  
5 providing a strong attachment between said first closure cup and said first ferrule.

1 39. (new) The system of claim 38, a bottom surface of said first closure cup being coined  
2 wherein portions of said bottom surface have a thickness less than 0.0025 inches where other  
3 portions of said bottom surface having a thickness of at least 0.003 inches.

1 40. (new) The system of claim 33, said first metal tubing being stainless steel and having an  
2 inner diameter of 0.062 inches and an outer diameter of 0.094 inches allowing said first metal tubing  
3 to be semi flexible.

1 41. (new) The system of claim 33, said rapid deflagrating cord having a diameter of 0.050  
2 inches.

1 42. (new) The system of claim 33, said rapid deflagrating cord comprising:  
2 a rapid deflagration material of  $\text{Cs}_2\text{B}_{12}\text{H}_{12}$  mixed with  $\text{KNO}_3$ ; and  
3 a metal encasement surrounding said rapid deflagration material, said metal encasement  
4 having a diameter of 0.050 inches.

1 43. (new) The system of claim 38, said first ferrule having a spit hole along a central axis  
2 thereof, said spit hole being bounded on a first side by said rapid deflagrating cord and being

3      bounded on a second side by a booster charge, said spit hole enabling and end of said rapid  
4      deflagrating cord to energize said booster charge to blow apart said first closure cup or to allow said  
5      booster charge to start the burning of said rapid deflagrating cord.

1            44. (new) The system of claim 34, said first loaded end fitting being one of a percussion  
2      primer end fitting, a detonating high energy end fitting and a low energy end fitting.

1            45. (new) The system of claim 36, said second loaded end fitting being one of a percussion  
2      primer end fitting, a detonating high energy end fitting and a low energy end fitting, when said first  
3      loaded end fitting is the detonating high energy end fitting or the low energy end fitting.

1            46. (new) The system of claim 36, said first loaded end fitting being one of a percussion  
2      primer end fitting, a detonating high energy end fitting and a low energy end fitting, and said second  
3      loaded end fitting being one of a detonating high energy end fitting and a low energy end fitting.

1            47. (new) The system of claim 36, said first or second loaded end fitting being a percussion  
2      primer end fitting comprising:

3            a ferrule having a crimped portion crimped at a first end of said ferrule over the crimped  
4      portion of said first metal tubing, an annular groove disposed at a second end of said ferrule, and an  
5      O-ring disposed in said annular groove;

6            a B-nut disposed over said first end of said ferrule for firmly holding said ferrule in place on

7       said first metal tubing;

8               a percussion primer disposed in a compartment in said second end of said ferrule; and

9               a closure disk disposed over said percussion primer and closing said compartment, said  
10       closure disk being formed of stainless steel of sufficient thickness to permit said percussion primer  
11       to ignite when said closure disk is struck by a firing pin.

1           48. (new) The system of claim 47, further comprising a plastic cap removably disposed over  
2       said closure disk, said second end of said ferrule and a threaded portion of said B-nut, said plastic  
3       cap serving to protect the percussion primer end fitting during shelf life and during transportation,  
4       said plastic cap being removed to permit said threaded portion of said B-nut to be threaded into a  
5       transfer manifold to enable said percussion primer to be ignited.

1           49. (new) The system of claim 48, said O-ring being made of silicone rubber and forms a  
2       hermetic seal between said ferrule and said transfer manifold.

1           50. (new) The system of claim 36, said first or second loaded end fitting being a low energy  
2       deflagrating end fitting comprising:

3               a ferrule having a crimped portion crimped at a first end of said ferrule over the crimped  
4       portion of said first metal tubing, an annular groove disposed at a second end of said ferrule, said  
5       second end of said ferrule having predetermined slanted portion, wherein said annular groove is  
6       formed in said predetermined slanted portion of said second end of said ferrule, and an O-ring

7 disposed in said annular groove;

8 a low energy booster charge disposed in a void formed along a central axis of said second  
9 end portion of said ferrule;

10 a spit hole formed along a central axis of a middle portion of said ferrule and separating said  
11 rapid deflagrating cord from said low energy booster charge;

12 a closure cup fitted into said void for closing said void, said closure cup having a rim welded  
13 to said second end of said ferrule; and

14 a B-nut disposed over part of said first end of said ferrule, for firmly holding said ferrule in  
15 place on said first metal tubing, and over said middle portion and a part of said second end of said  
16 ferrule.

1 51. (new) The system of claim 50, further comprising an end cap removably disposed over  
2 said closure cup, said second end of said ferrule and a threaded portion of said B-nut, said end cap  
3 serving to protect the low energy deflagrating end fitting during shelf life and during transportation,  
4 said end cap being removed to permit said threaded portion of said B-nut to be threaded into a  
5 transfer manifold.

1 52. (new) The system of claim 36, said first or second loaded end fitting being a detonating  
2 high energy end fitting comprising:

3 a ferrule having a crimped portion crimped at a first end of said ferrule over the crimped  
4 portion of said first metal tubing, an annular groove disposed around a middle portion of said ferrule,

5 and an O-ring disposed in said annular groove;

6 a special silicone rubber seal annularly disposed around a first portion of a second end of said  
7 ferrule;

8 a stainless steel interface retainer having an annular shape and disposed around a second  
9 portion of said second end of said ferrule between said O-ring and said special silicone rubber seal,  
10 a rim of the stainless steel interface retainer being welded to the ferrule;

11 a closure cup having a rim welded to an outside annular surface of said ferrule directly  
12 underneath said stainless steel retainer;

13 a high energy detonation charge and a lead azide booster charge disposed said closure cup,  
14 said lead azide booster charge being disposed between said second end portion of said ferrule and  
15 said high energy detonation charge;

16 a spit hole formed along a central axis of said second end of said ferrule and separating said  
17 rapid deflagrating cord from said lead azide booster charge; and

18 a B-nut disposed over part of said first end of said ferrule, for firmly holding said ferrule in  
19 place on said first metal tubing, and over said middle portion, a part of said second end of said  
20 ferrule and part of said stainless steel interface retainer.

1 53. (new) The system of claim 52, further comprising an end cap removably disposed over  
2 said closure cup, said second end of said ferrule and a threaded portion of said B-nut, said end cap  
3 serving to protect the detonating high energy end fitting during shelf life and during transportation,  
4 said end cap being removed to permit said threaded portion of said B-nut to be threaded into a

5 transfer manifold.

1 54. (new) An ordnance energy transfer system, comprising a transfer line, said transfer line  
2 including:

3 an aluminum tube;

4 a rapid deflagrating material filling said aluminum tube, said rapid deflagrating material  
5 having a burn a rate of 1000 to 1500 feet per second;

6 a semi-flexible stainless steel tube centrally disposed over said aluminum tube, said stainless  
7 steel tube being shorter in length than said aluminum tube, each end portion of said stainless steel  
8 tube being crimped onto said aluminum tube to hold said aluminum tube in place, wherein in inner  
9 surface area of the non-crimped portion of said stainless steel tube is separated from said aluminum  
10 tube by 0.006 inches.

1 55. (new) The system as set forth in claim 54, said aluminum tube having an outer diameter  
2 of 0.050 inches.

1 56. (new) The system as set forth in claim 54, said stainless steel tube having an inner  
2 diameter of 0.062 inches and an outer diameter of 0.094 inches.

1 57. (new) The system as set forth in claim 54, further comprising:

2 a first loaded end fitting disposed at a first end of said transfer line; and



3 a second loaded end fitting disposed at a second end of said transfer line, said first loaded end  
4 fitting being one of a percussion primer end fitting, a detonating high energy end fitting and a low  
5 energy end fitting, and said second loaded end fitting being one of a detonating high energy end  
6 fitting and a low energy end fitting.

1 58. (new) The system as set forth in claim 57, said percussion primer end fitting comprising:  
2 a ferrule having a crimped portion crimped at a first end of said ferrule over the crimped  
3 portion of said first metal tubing, an annular groove disposed at a second end of said ferrule, and an  
4 O-ring disposed in said annular groove;  
5 a B-nut disposed over said first end of said ferrule for firmly holding said ferrule in place on  
6 said first metal tubing;  
7 a percussion primer disposed in a compartment in said second end of said ferrule; and  
8 a closure disk disposed over said percussion primer and closing said compartment, said  
9 closure disk being formed of stainless steel of sufficient thickness to permit said percussion primer  
10 to ignite when said closure disk is struck by a firing pin.

1 59. (new) The system as set forth in claim 58, further comprising a plastic cap removably  
2 disposed over said closure disk, said second end of said ferrule and a threaded portion of said B-nut,  
3 said plastic cap serving to protect the percussion primer end fitting during shelf life and during  
4 transportation, said plastic cap being removed to permit said threaded portion of said B-nut to be  
5 threaded into a transfer manifold to enable said percussion primer to be ignited..

1           60. (new) The system as set forth in claim 57, said low energy deflagrating end fitting  
2 comprising:

3           a ferrule having a crimped portion crimped at a first end of said ferrule over the crimped  
4 portion of said first metal tubing, an annular groove disposed at a second end of said ferrule, said  
5 second end of said ferrule having predetermined slanted portion, wherein said annular groove is  
6 formed in said predetermined slanted portion of said second end of said ferrule, and an O-ring  
7 disposed in said annular groove;

8           a low energy booster charge disposed in a void formed along a central axis of said second  
9 end portion of said ferrule;

10          a spit hole formed along a central axis of a middle portion of said ferrule and separating said  
11 rapid deflagrating material from said low energy booster charge;

12          a closure cup fitted into said void for closing said void, said closure cup having a rim welded  
13 to said second end of said ferrule; and

14          a B-nut disposed over part of said first end of said ferrule, for firmly holding said ferrule in  
15 place on said first metal tubing, and over said middle portion and a part of said second end of said  
16 ferrule.

1           61. (new) The system as set forth in claim 60, further comprising an end cap removably  
2 disposed over said closure cup, said second end of said ferrule and a threaded portion of said B-nut,  
3 said end cap serving to protect the low energy deflagrating end fitting during shelf life and during

4 transportation, said end cap being removed to permit said threaded portion of said B-nut to be  
5 threaded into a transfer manifold.

1 62. (new) The system as set forth in claim 57, said detonating high energy end fitting  
2 comprising:

3 a ferrule having a crimped portion crimped at a first end of said ferrule over the crimped  
4 portion of said first metal tubing, an annular groove disposed around a middle portion of said ferrule,  
5 and an O-ring disposed in said annular groove;

6 a special silicone rubber seal annularly disposed around a first portion of a second end of said  
7 ferrule;

8 a stainless steel interface retainer having an annular shape and disposed around a second  
9 portion of said second end of said ferrule between said O-ring and said special silicone rubber seal,  
10 a rim of the stainless steel interface retainer being welded to the ferrule;

11 a closure cup having a rim welded to an outside annular surface of said ferrule directly  
12 underneath said stainless steel retainer;

13 a high energy detonation charge and a lead azide booster charge disposed said closure cup,  
14 said lead azide booster charge being disposed between said second end portion of said ferrule and  
15 said high energy detonation charge;

16 a spit hole formed along a central axis of said second end of said ferrule and separating said  
17 rapid deflagrating material from said lead azide booster charge; and

18 a B-nut disposed over part of said first end of said ferrule, for firmly holding said ferrule in

19 place on said first metal tubing, and over said middle portion, a part of said second end of said  
20 ferrule and part of said stainless steel interface retainer.

1 63. (new) The system as set forth in claim 62, further comprising an end cap removably  
2 disposed over said closure cup, said second end of said ferrule and a threaded portion of said B-nut,  
3 said end cap serving to protect the detonating high energy end fitting during shelf life and during  
4 transportation, said end cap being removed to permit said threaded portion of said B-nut to be  
5 threaded into a transfer manifold.

1 64. (new) The system as set forth in claim 54, said rapid deflagrating material comprising  
2  $\text{Cs}_2\text{B}_{12}\text{H}_{12}$  mixed with  $\text{KNO}_3$ .

1 65. (new) The system as set forth in claim 60, said low energy booster charge comprising  
2  $\text{Cs}_2\text{B}_{12}\text{H}_{12}$  mixed with  $\text{KNO}_3$ .